

Name: _____

Date: _____

Algebra 1B Pd: ____

Weekend Word Problem #17: Projectile Motion

The Situation: The height of an object that is projected into the air can be calculated using the quadratic equation:

$$h = -16t^2 + vt + c$$

where: -16 is a constant to represent gravity in ft/sec

h = height of object t = time in the air

v = initial velocity c = initial height

Kirk Cousins throws a football in an arc from an initial height of 6 ft at an initial velocity of 80 ft/sec.

a. Write the equation for the situation, filling in the values for initial height and initial velocity and leaving h and t as variables.

b. Circle the correct word in each parentheses:

Since the coefficient of t^2 is -16, the parabola will open (upward, downward), the vertex is the

(maximum, minimum) point and the parabola is (wider, narrower) than the parent function.

c. SKETCH the parabola below.

d. Find the t coordinate of the vertex using $-b/2a$ to find how many seconds it will take the football to reach its maximum height.

e. Find the h coordinate of the vertex using your t coordinate, substitution and evaluation to find the maximum height of the football.

f. Write at least ONE complete sentence to describe the throw in an algebraic sense. Use the VALUES you discovered in parts d and e.

g. Write at least ONE complete sentence to describe a specific situation where the formula for projectile motion would be useful in the real world (do not use sports).

<hr/>
